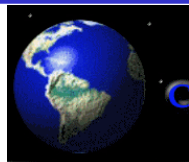


International Symposium on Near-term Solutions for Climate Change Mitigation in California

Mitigation options identified in the Third National
Communication of Mexico

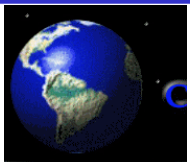
Israel Laguna M. Sc.
National Institute of Ecology of Mexico

March 7, 2007



Presentation Outline

- ❖ Third National Communications of Mexico to the UNFCCC
 - UNFFCCC process
 - GHG emission Inventory 1990 -2002
 - Expected impacts of Climate Change
- ❖ Interministerial Committee on Climate Change
 - Towards a National Climate Change Strategy
- ❖ Greenhouse Gas Accounting and Reporting Voluntary Program



National Institute of Ecology (INE)

INE is a decentralized body of the **Ministry of Environment and Natural Resources (SEMARNAT)**.

INE has under its mission the **coordination of research on environmental issues**, in order to provide data, ideas, proposals, and technical inputs **for decision-making** to support the environmental and natural resources management of Mexico.

INE is in charge of developing and integrating the National Communications of Mexico to the UNFCCC.

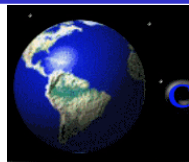
- ❖ Up-dating of National Greenhouse Gas Inventories
- ❖ Technical studies on GHG mitigation
- ❖ Vulnerability assessments and adaptation options to climate change.

The INE is the Mexican government institution in charge of fulfilling the requirements and complying with Mexico's commitments to the UNFCCC:

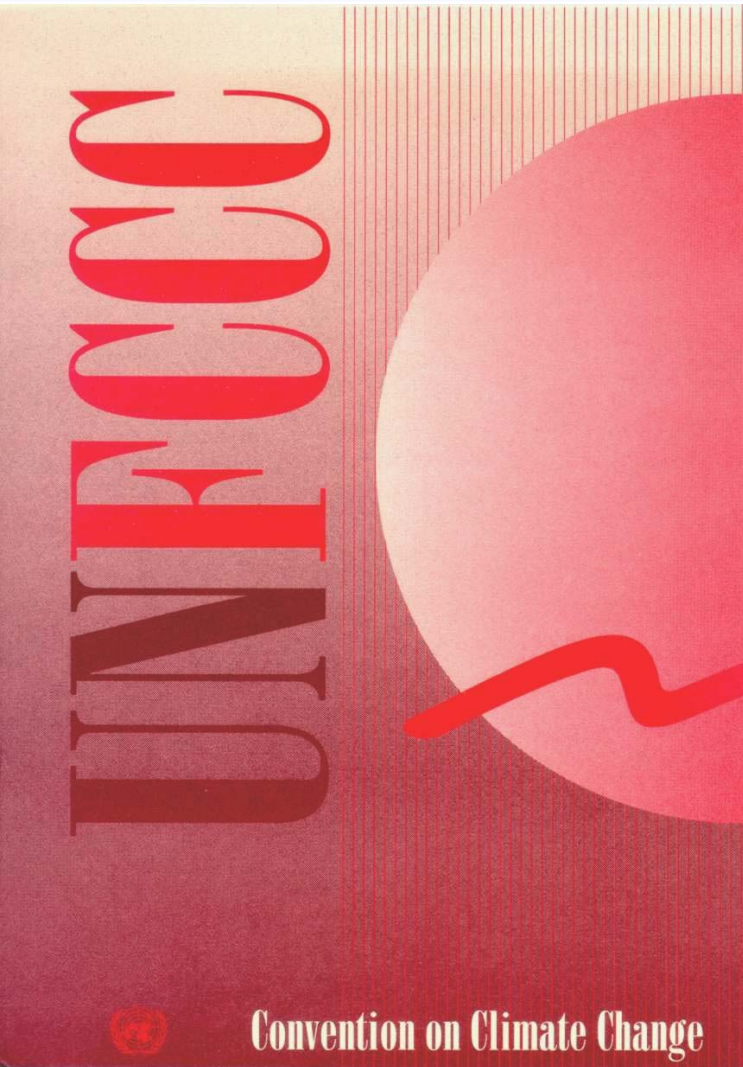


As a Non-Annex I party, Mexico shall comply with UNFCCC Article 4, including 4.1 paragraphs (a), (b) and (i) :

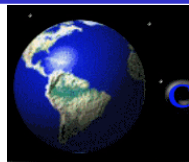
- ❖ Develop, periodically update, publish and make available to the COP, in accordance with Article 12, **national inventories of anthropogenic emissions by sources and removals by sinks of all GHG not controlled by the Montreal Protocol.**
- ❖ Formulate, implement, publish and regularly update national, and where appropriate, **regional programmes containing measures to mitigate climate change...** and measures to facilitate adequate adaptation to climate change.
- ❖ **Communicate to the COP** information related to implementation



Mexico and the UNFCCC



- **Mexico signed the UNFCCC in 1992**, and ratified it in 1993.
- The Convention came into force for Mexico on March 21, 1994.
- **Mexico signed the Kyoto Protocol on June 9, 1998.** *The Mexican Senate approved the Kyoto Protocol on April 29, 2000.*
- Establishment of the **Mexican Committee for GHG mitigation projects.** January 23, 2004.
- Establishment of the **Interministerial Commission on Climate Change** on April 25, 2005.



Mexico's National Communications

- The **First National Communication** of Mexico was submitted to the UNFCCC in 1997. This first report included the advances and results of:

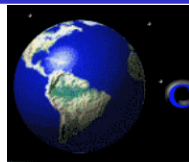
- The first national GHG inventory
- GHG emission mitigation studies
- Studies on vulnerability and adaptation

Funds from US Country Studies Program and UNEP/GEF

- The **Second National Communication** was submitted to the UNFCCC in 2001.

(Mexico was the first Non-Annex I Country to carry out its Second Communication)

<http://www.ine.gob.mx/dgicurg/cclimatico/comnal.html>



Mexico: Third National Communication to the UNFCCC.

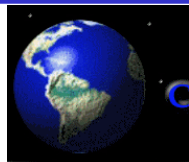
Content



Introduction,
Executive summary (Spanish and English)

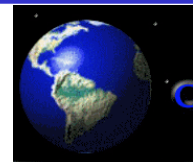
- I. National circumstances.
- II. National GHG Emission Inventory (1990-2002).
- III. Institutional arrangements to implement the Convention.
- IV. Programmes and measures to facilitate adequate adaptation to climate change.
- V. Programmes and measures to mitigate climate change.
- VI. Other relevant information: Research, systematic observation, education and public awareness, capacity building and technology transfer, international cooperation.
- VII. Constrains and gaps, and related financial, technical and capacity needs.
- VIII. Bibliography.

<http://www.ine.gob.mx/dgicurg/cclimatico/comnal.html>



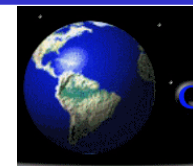
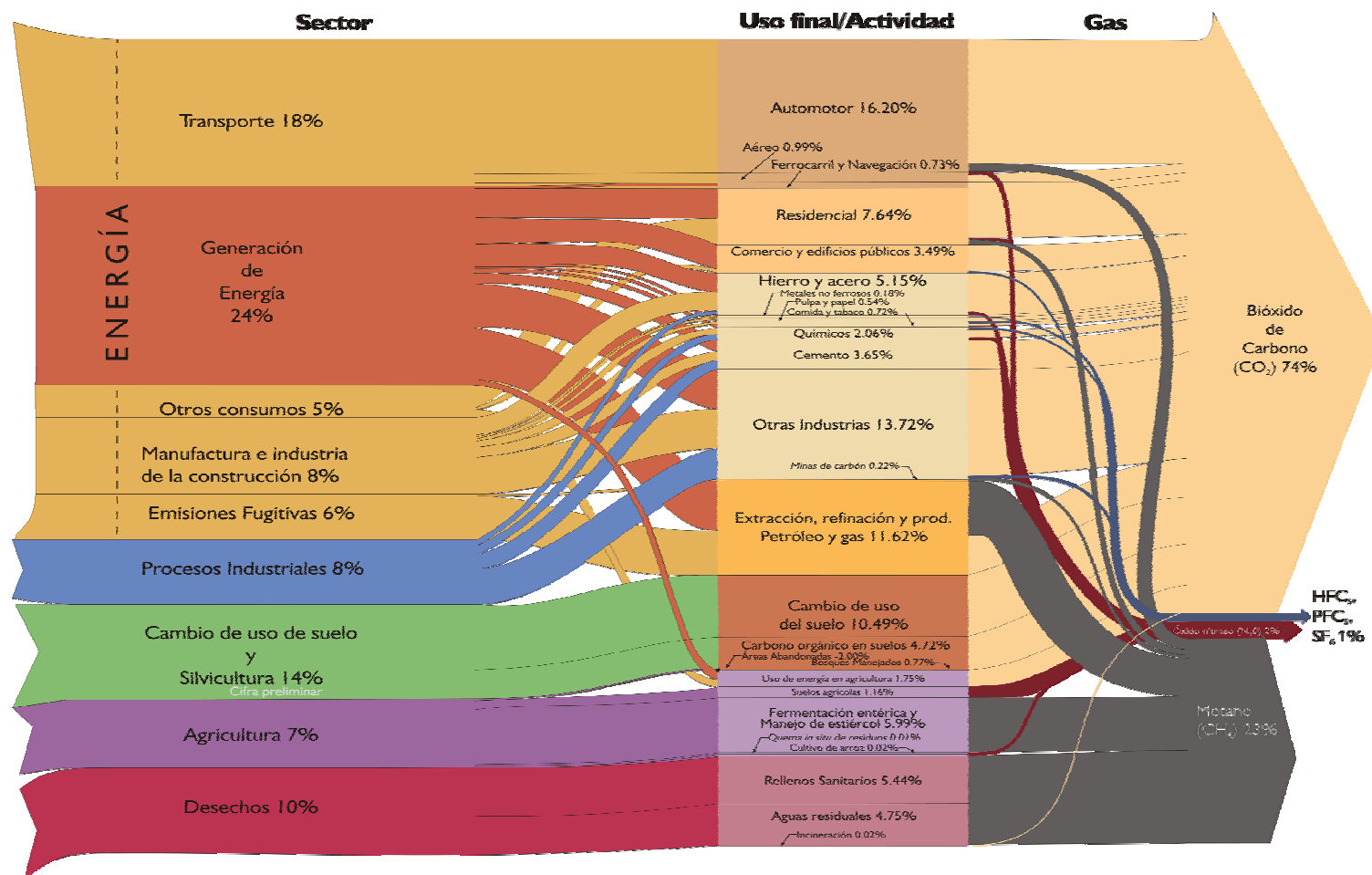
National GHG Emission Inventory (INEGEI) 1990- 2002

- The INEGEI is the **third national GHG emissions** inventory prepared by Mexico since the Convention entered into force in 1994.
- The INEGEI 1990-2002 **recalculated the emission estimates for 1990-1998 and estimated the emissions for 2000 and 2002.**
- In addition, the INEGEI:
 - **Includes gases and sources not estimated in the two previous inventories.**
 - Identifies source categories.
 - Incorporates a trend analysis and identifies contribution by source and gas.
 - **Compares Mexico with 54 countries (who represent 95% of global emissions to 2003, based on IEA data) in terms of total emissions from fossil fuels combustion, emissions per capita and emissions per GDP.**

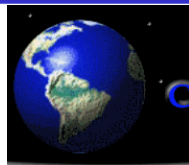
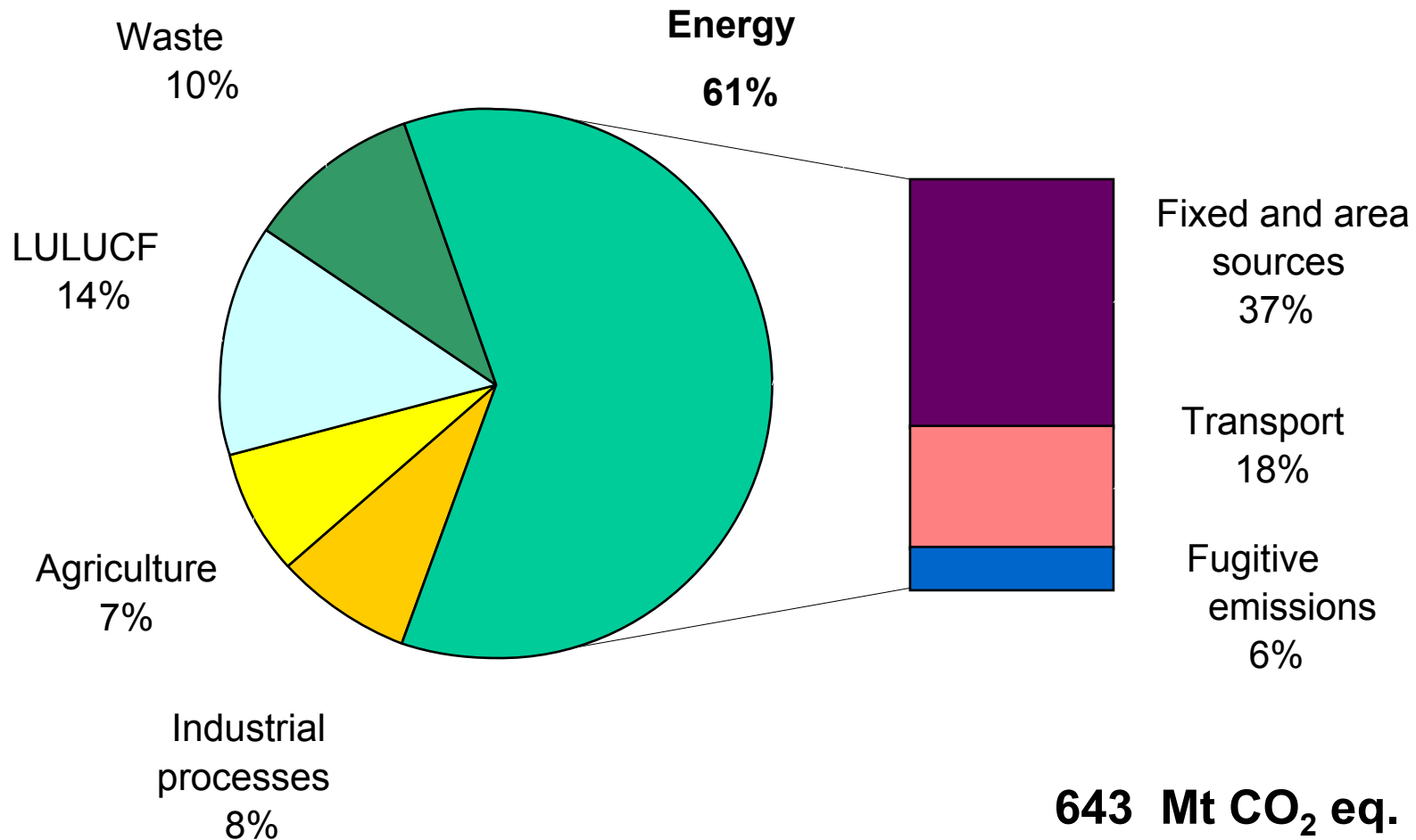


GHG emissions, 2002

643.18 Million tons of CO₂ eq.

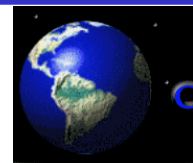


Emissions by source, in CO₂ eq. (2002)



National GHG Emission Inventory (INEGEI) 1990- 2002

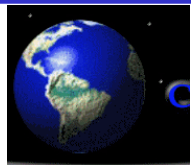
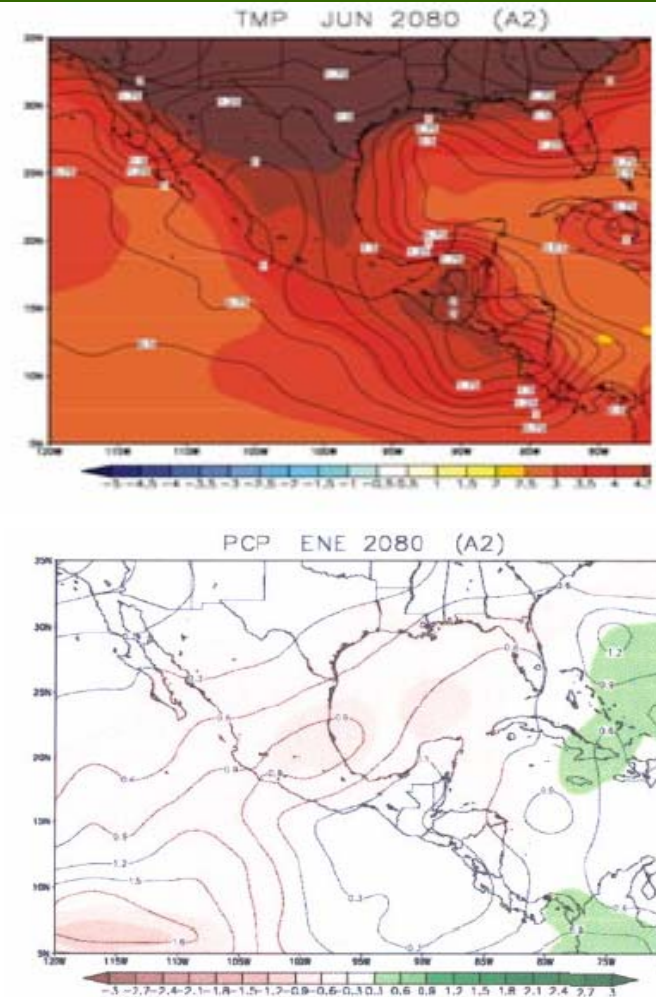
- ❖ GHG emissions to 2002 are **30% higher than** those estimated for **1990**.
- ❖ Mexico emissions grew at an annual **average rate of 2.2%**.
- ❖ Energy sector is the most significant source of GHG; **energy industries, transport and manufacturing industries and construction** are the largest contributors to Mexico emissions .



Climate change scenarios for Mexico:

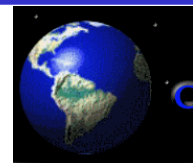
Expected changes in temperature and precipitation

- Very likely that mean temperature in Mexico will **increase by 2 to 4°C by 2080**, mainly in the northern part of Mexico.
- **In the Winter**, very likely that **precipitation will decrease by 15% in the central part of the country**, and by 5% in the region around the Gulf of Mexico.
- **In the Summer**, **precipitation may decrease by 5%** in the central part of Mexico.
- Delays on the beginning of the rain season are expected, and the season will likely extend to the Autumn in many parts of the country.



Expected impacts of climate change in Mexico

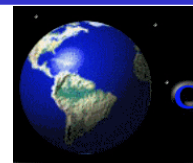
- Vulnerable groups: may be directly affected by heat waves or indirectly by alterations on the life span of insects and parasites that may cause dengue or diarrheic diseases.
- **Electricity demand:** increases on mean temperature will increase the electricity demand for refrigeration on homes, business, and industry.
- **Energy industries infrastructure:** including oil platforms in the Gulf of Mexico, may be affected by extreme hydro meteorological events such as storms, heavy rains and hurricanes.
- Beach tourism: will face more intense extreme events in addition to sea level rise.
- The central part of Mexico (the most intensive and productive agricultural area) will be threatened by climate change, with expected impacts on ecosystems and changes in vertebrates distribution.



Interministerial Climate Change Commission (ICCC)

The Interministerial Climate Change Commission (ICCC) was established for the purpose of **coordinating the actions** of the agencies and entities **of the Mexican Federal Government related to:**

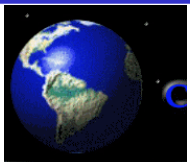
- ❖ the **design and implementation of national policies** for preventing and **mitigating greenhouse gas emissions**
- ❖ adapting to the effects of climate change and, in general
- ❖ **promoting the development of climate change action programs** and strategies geared to the fulfillment of the commitments made by Mexico within the UNFCCC and other instruments deriving from it, in particular the Kyoto Protocol.



Cont...

The Commission is composed of the Mexican Ministers of:

- ❖ Foreign Affairs;
- ❖ Social Development;
- ❖ Environment and Natural Resources (chairman of the Commission);
- ❖ Energy;
- ❖ Economy; Agriculture, Livestock, Rural Development, Fisheries and Food;
- ❖ Communications and Transportation.
- ❖ The Minister of Finance and Public Credit participates in the Commission's meetings on a permanent basis.



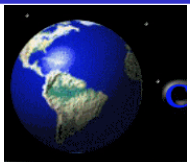
Towards a National Climate Change Strategy

The Ministry of the Environment and Natural Resources (**SEMARNAT**) and the Ministry of Energy (**SENER**) worked in collaboration with the Mario Molina Center for Strategic Studies on Energy and the Environment [CMM in Spanish] in order to **analyze options in the energy production and consumption sector that could be included in a national climate change strategy.**

The studies carried out by the CMM served as a basis for constructing subsequent proposals

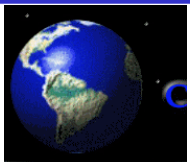
- ❖ **Identify GHG mitigation opportunities and conduct emissions reduction projects.**
- ❖ Acknowledge the vulnerability of different sectors and launch local and national capacity building programs for adaptation

<http://www.semarnat.gob.mx>



Formulation process

- ❖ ICCC established on April 2005 to coordinate, formulate and adopt climate change policies.
- ❖ A preliminary document was prepared by participating ministries in conjunction with the Mario Molina Center for strategic studies on energy and the environment (CMM).
- ❖ **Public consultation, led by the Climate Change Advisory Board, including a public meeting on August 2, 2006.**
- ❖ Final text and Executive Summary approved by the ICCC for publication.



Contents

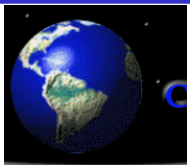
1. GHG Emissions and Mitigation Opportunities

- ❖ 1.1 Energy Production and Consumption
- ❖ 1.2 Vegetation and Land Use

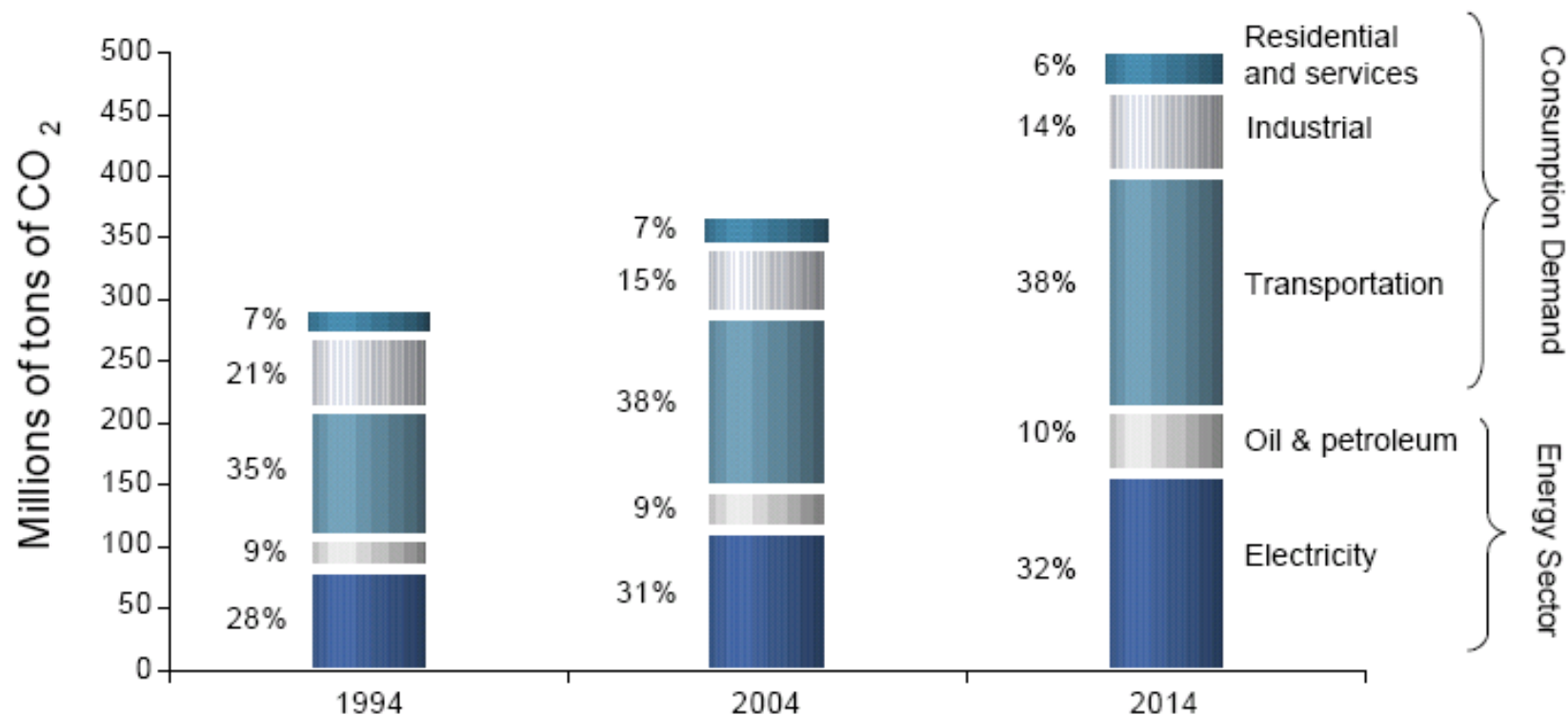
2. Vulnerability to CC and Adaptation Actions

- ❖ 2.1 Vulnerability to Climate Change in Mexico
- ❖ 2.2 Priority Actions for Adaptation

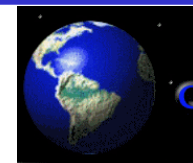
<http://www.semarnat.gob.mx>



Evolution of CO₂ emissions 1994-2014 by sectors, in millions of tons



SOURCE: CMM 2006. Prepared with data from Balance Nacional Energético (BNE) [National Energy Balance] 2004, Ministry of Energy (SENER) 2005; Outlooks for the Electrical Sector, Natural Gas Sector, Liquefied Propane Gas Sector and Petroleum Sector, 2005-2014, Ministry of Energy 2005.

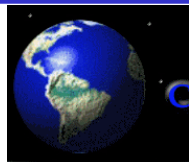


GHG mitigation opportunities to the year 2014.

Estimated Emission Reductions (EER) in millions of tons of CO₂e/year

	Type of activity	Proposal	EER
1	Cogeneration in national industry	To take advantage of the cogeneration potential in the country's industries, especially cement, iron and steel, and sugar (with sugarcane bagasse as a biofuel)	>25.0
2	Electricity generation	To achieve an increase of two percentage points in the efficiency of transmission and distribution lines and in that of thermoelectric plants using <i>combustóleo</i> [heavy fuel oil] (8.0 and 0.7 million tons of CO ₂ , respectively)	8.7
3	Cogeneration in PEMEX	To install four 350-MW cogeneration plants in the refineries at Madero (State of Tamaulipas); Minatitlán (State of Veracruz), Salamanca (State of Guanajuato), and Tula (State of Hidalgo)	14.0
4	Centralized supply of electric power to oil platforms	To replace all power generation equipment with a 115-MW combined-cycle plant	2.3
5	Energy performance in refineries	To increase PEMEX Refining's energy efficiency goal by 5 percentage points	2.7
6	Conversion to natural gas and re-powering of thermoelectric plants run by the Mexican Federal Electricity Commission (CFE) on the Pacific coast, along with the modernization of the national refining system	This proposal calls for several different simultaneous actions: freeing the Salina Cruz refinery from heavy fuel oil production and reconfiguring it; installing a re-gasification terminal for imported liquefied natural gas on the Pacific coast; and converting thermoelectric plants on that coast which use heavy fuel oil to combined cycle technologies utilizing natural gas	21.0

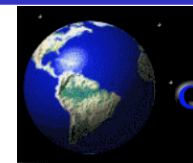
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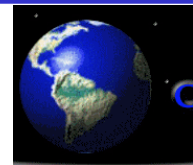
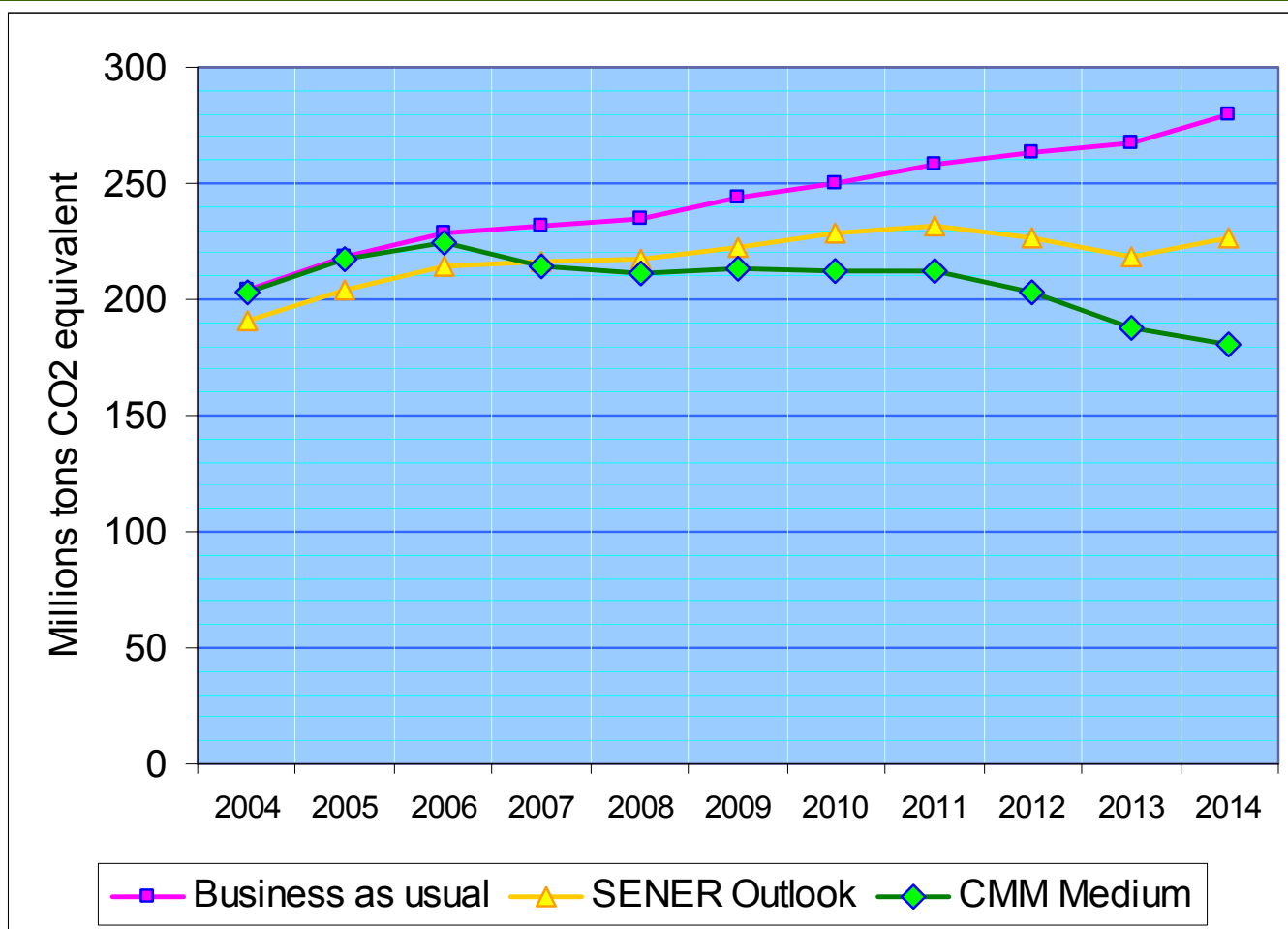
Cont..

7	CO ₂ capture and geological storage	To inject smokestack gases from the Atasta complex (State of Campeche) into the Cantarell Oil Field (Campeche) to increase oil-well pressure and capture CO ₂	>1.4
8	Reduction of fugitive methane emissions	To reduce by 30% fugitive emissions associated with natural gas transportation and distribution by PEMEX, as well as to enhance the efficiency of gas flarers at oil platforms	0.2
9	Urban solid waste (USW) (not including methane capture projects in existing landfills)	To install (at least 8) efficient high-temperature USW combustion systems coupled to combined cycles which would generate, in total, at least four thousand GWh of electric power per year	2.4
10	Renewable energy sources (wind, minihydraulic, and geothermal)	To reach an installed capacity of 7,000 MW to generate 16,000 GWh/year (does not include the hydroelectric plants at El Cajón [State of Nayarit] and La Parota [State of Guerrero])	9.0
11	Automotive industry	To improve automotive efficiency by 15% as of the year 2008	5.0
12	Replacement of federal motor transport vehicles	To replace federal motor transport vehicles that are over 10 years old, as of the year 2008	2.0
13	Railways	To widen coverage of railway freight transport by 10%	1.5
14	Bioethanol	To include 10% bioethanol in PEMEX's gasoline mixtures	10.6
15	Biodiesel	To include 5% biodiesel in PEMEX's diesel mixture	3.1

<http://www.semarnat.gob.mx>

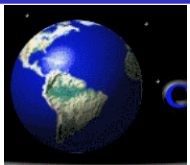


GHG emissions and mitigation opportunities from oil production, electricity generation and industrial activities in Mexico.



Results

- **Multiple GHG mitigation and adaptation opportunities** coupled with the sustainable development of Mexico
- Opportunities, in the short term, to substantially reduce emissions from energy use and generation.
- Opportunities in forestry and agriculture to protect and increase carbon sinks.
- Opportunities to reassess or undertake land use plans to reduce vulnerability and enhance capacity building for adaptation to climate change

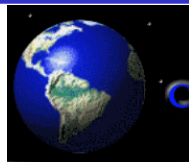


Mexico Greenhouse Gas Accounting and Reporting Voluntary Program

- ❖ On August 25th 2004, a two-year **partnership** was established between **SEMARNAT – WRI – WBCSD** to design and implement a Voluntary Pilot Program for GHG Accounting and Reporting in Mexico.
- ❖ On October 2nd 2006, the partnership was renewed and extended, including CESPEDES, to establish a permanent **Voluntary Program for Corporate and Project Accounting and Reporting in Mexico**.

Contact:

Undersecretary of Enhancement and Environmental Regulation / Ministry of Environment and Natural Resources <http://www.semarnat.gob.mx>



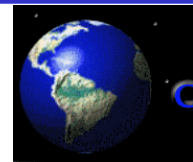
Objetives

Capacity building in Mexican companies to:

- ❖ Develop corporate GHG emissions inventories
- ❖ Develop mitigation projects

For the identification of opportunities to:

- ❖ Increase their operative efficiency
- ❖ Conduct effective strategies
- ❖ Participate in international carbon markets – as CDM projects or in voluntary markets



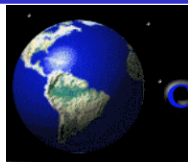
Structure

Phase I – GHG Corporate Inventories

- ❖ Based on The GHG Protocol: A Corporate Accounting and Reporting Standard (WRI/WBCSD)
- ❖ Training and Capacity-Building for the development of GHG Corporate Inventories
- ❖ Public GHG Inventory Reports

Phase II – GHG Project Reduction Accounting

- ❖ Based on the GHG Protocol for Project Accounting (WRI/WBCSD)
- ❖ Training and Capacity-Building for the quantification of GHG emissions reductions in reduction projects



Participating companies

Cement

- CEMEX México
- Cooperativa La Cruz Azul
- Cementos Moctezuma
- Grupo Cementos de Chihuahua
- Holcim Apasco
- LaFarge

Iron and Steel

- Altos Hornos
- DeAcero
- Grupo IMSA
- Mittal Steel
- SICARTSA
- Siderúrgica Tultitlan
- ▲ Hierro Recuperado
- ▲ Instituto de Fundición y Maquinado de Jalisco

Automotive

- Ford de México
- ▲ Honda de México

Glass

- VITRO

Construction

- Urbi Desarrollos Urbanos

Beer and Brewing

- Grupo Modelo
- Cervecería Cuauhtémoc Moctezuma

Mining

- Industria Minera México
- Industria Peñoles
- Minera Autlán

Waste Handling

- Cappy & Associates
- SIMEPRODE

Chemical

- Colgate – Palmolive
- AMANCO México
- Nhumo
- ▲ ANAJALSA Agroquímicos
- ▲ Boehringer Ingelheim

Oil and gas

- PEMEX

Packing

- Tetrapak

Food

- Grupo Bimbo
- ▲ Cámara Alimenticia de Jalisco

Machinery

- Caterpillar México
- S&C Electric Mexicana
- Johnson Controls
- ▲ Hitachi Global Storage Technologies México
- ▲ Cerraduras TESA

Swine Farms

- Grupo Porcícola Mexicano

Public Transport

- Red de Transporte Público del Distrito Federal

Forestry

- Forestaciones Operativas

Services

- Sumitomo Corporation de México
- Industrias John Deere

Univerisity

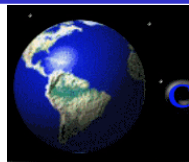
- ▲ ITESM Campus Guadalajara

Refrigerants

- Ecofreeze natural refrigerants

Next steps

- Consolidate the Quality of the Corporate GHG Inventories
- Incorporate utilities in the program
 - 1/3 of the National GHG emissions
- Plan an On-line Electronic Registry for GHG emissions / reductions – Pilot Project
- Develop GHG reduction projects
 - Based on production and energy efficiency improvements



!! Thank you for your attention and time !!

Israel Laguna Monroy

Climate Change Program

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<http://www.ine.gob.mx/dgicurg/cclimatico/index.html>

http://cambio_climatico.ine.gob.mx/